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ABSTRACT

A data based method for mainstreaming involving 120 elementary students (grades 1 through 5) enrolled in a resource room was utilized. Ss were monitored to find the percent of assignments they were completing in their regular classroom, and to determine the feasibility of using this data base to identify students who were not achieving, and to determine the effectiveness of an intervention procedure combining self-instruction with extrinsic reinforcement. Data was collected in three measurement conditions (baseline, intervention, and end of year check) for 12 students identified as needing extra help as an evaluation program. Six of the Ss exceeded the level of assignment completion necessary. (Author/BD)

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INCREASING ELEMENTARY STUDENTS' ASSIGNMENT COMPLETION:

A DATA BASED METHOD FOR MAINSTREAMING

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Project AIMS

Clarkston School District

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Running head: Increasing Assignment Completion

ABSTRACT

One hundred twenty students enrolled in a resource room were monitored to determine the percent of assignments they were completing in their regular classroom. The two goals for this monitoring were: (1) To determine the feasibility of using this data base to define students who were not achieving. (2) To use this data-base to determine the effectiveness of an intervention procedure combining self-instruction with extrinsic reinforcement. Thirty-five of the students were identified as needing extra help to perform successfully in the regular classroom. Data was collected in three measurement conditions (baseline, intervention, and end of year check) for 12 of these students as an evaluation of the program. Six of the 12 students exceeded the level of assignment completion necessary to establish significance using a time-series statistic. Three other students demonstrated increases from baseline to intervention that could not be called significant because of the extreme variability of their performance during baseline. The results were seen as an important tool in mainstreaming programs. Students could be monitored to determine which were not performing and the intervention procedures could be implemented with those students identified.

INCREASING ELEMENTARY STUDENTS' ASSIGNMENT COMPLETION: A DATA BASED METHOD FOR MAINSTREAMING

The directive to provide the least restrictive alternative in which every student can successfully perform has been suggested by empirical investigation and mandated by federal law. As is often the case, this mandate is several steps ahead of the research methods which will eventually point out the procedures necessary to provide the most successful learning environment possible for every child. The present study is an attempt to deal with two common problems in mainstreaming. The first problem concerns how to define a data base that can provide continuous feedback about children who have been mainstreamed into a regular classroom. The second concerns how to use this data base to define a method that will help those students who need additional assistance before they can successfully perform outside the special classroom. A wide variety of potentially effective methods to increase student productivity are available. In this paper attention is given to the need for extrinsic reinforcement that these students often demonstrate by their poor classroom performance. Most special education teachers have used extrinsic reinforcement, whether in the form of a token economy or simply by making certain that verbal praise is contingent upon success.

The second method with which this paper is concerned relies heavily on procedures designed to teach self-control, (Michenbaum and Cameron, 1974; Farnum and Brigham, 1977; Neimann and Brigham, 1976; Watson and Tharp, 1972). The combination of self-control and extrinsic reinforcement results in a set of procedures that can be profitably used by special education teachers who need to make timely decisions about the effectiveness of mainstreaming programs. Self-control procedures have received extensive research in the field of applied behavior analysis, but have not yet been widely used in special education classrooms. The relevance of this research to problems in special education may be more obvious with a closer look at the types of research that are being carried out in that field.

Self-Control The division of Behavior Analysis called self-control has become a 'popular' psychology. The self-control model of behavior intervention has been used in a wide variety of educational and clinical settings in the past decade. Brigham (1976) cites two sources of criticism which prompted

educators and behavior analysts to develop the self-control model. The first was Silberman's (1970) Carnegie Report charging that students were passive agents in classrooms extensively controlled by teachers and principals. The second source of criticism came from a Wynette and Winkler article in the Journal of Applied Behavior Analysis (1972). The title of the article was "Current Behavior Modification in the Classroom: Be Still, Be Quiet, Be Docile". As the title suggests, Wynette and Winkler were criticizing the limited application of operant techniques to the task of removing excessive activity and noise from the public school classroom. They felt that a more effective use of behavior analysis would be to align the classroom environment with behavioral principles. This re-alignment would increase the likelyhood that appropriate academic behaviors would occur. These two cirticisms prompted an increased amount of research on the self-control model. The goal of these studies was to maximize the effect individuals could exert on their environment. The result of appropriate application of these procedures would be to teach students to be more 'responsible' for their actions and less dependent on their teachers.

Self-control procedures are also valuable in educational settings because of their potential for creating programs that are durable and generalizable. Researchers in self-control have paid close attention to the impact their procedures have in terms of how long the newly acquired behaviors last (durability), and whether these new behaviors are used in other appropriate settings (generalization). They are concerned with these aspects of behavior change because procedures which achieve change only during the training session are of little value. These concerns are closely related to problems involved in mainstreaming. This study is an attempt to include planning for both generalization and durability as an integral part of the procedures.

Self-Instruction The field of self-control has been divided into a number of more specific procedures (e.g. Self-evaluation, Farnum and Brigham, 1977; Self-reinforcement, Farnum, Brigham, and Johnson, 1977; Self-determination, Bushell and Bushell, 1976). Self-instruction is a set of procedures developed to achieve better working skills with impulsive kindergarten students (Michenbaum and Goodman, 1971). These procedures include the fading of prompts and instructions from overt and external conditions to covert self-produced re-

sponses. While the Meichenbaum and Goodman research indicated these procedures were effective with impulsive children, as indicated by a one month follow-up assessment, the lack of significant treatment effects obtained on two indices of classroom behavior led Bornstein and Quevillon (1976) to further explore the use of this self-control procedure. Their investigation explored the use of self-instructional programs on pre-school classroom performance. The results from this study indicated that the self-instruction procedure was effective in bringing about quick and dramatic increases in appropriate behavior.

An Application The present investigation sought to explore the application of these self-instruction procedures with students who were receiving additional help for 30-60 minutes per day in a resource room.

Students were selected, not on the basis of impulsivity, but rather because they were low performers, as demonstrated by data collected during a two week baseline phase. Data taken in the present study focused on classroom productivity. Classroom teachers emphasized that assignment completion, not attending behavior, was the best measure of student performance. The specific data collected was the percent of assignments completed per day. The need to use this dependent variable measure has become obvious. During the three years previous work in a small school district in southeastern Washington, teachers have often commented that many children are capable of attending to the task given them but fail to increase their productivity. Teaching students to stare at their paper, while accomplishing little work was of no value to the classroom teacher, project staff, or the student. The self-instruction procedure appeared to be a method that could be combined with extrinsic reinforcement to increase the productivity of children who were performing poorly in the classroom.

METHOD

Subjects The target subjects in this study were students from the Project AIMS* Resource Room. The students were enrolled in grades 1-5 in three elem-

*Project AIMS is funded by a grant from a Washington State agency for Urban, Rural, Racial and Disadvantaged programs, (URRD).

entary schools in Clarkston, Washington. They qualified for the Resource Room based on performance on the California Achievement Test (CAT). The admissions criterion for the AIMS resource room was 80% of the expected grade equivalent score. One hundred twenty students were involved in the workshop and data collection portion of the procedures defined below. Of these, 35 fell below the 75% assignment completion criterion for one or more weeks during baseline. These 35 students received the self-instruction training in addition to the workshop sessions in which all 120 students participated. Twelve of these students received an end of year check (EOYC) during early May. These data are presented to evaluate the effectiveness of the procedures.

Procedure The classroom teacher recorded student assignment completion for a two week period prior to intervention (baseline). Teachers were asked to define an assignment and remain consistent with that definition throughout the study. While no reliability data was attempted, a concerted effort was made to achieve internal consistency on the part of each teacher.

After two weeks of baseline, the percentage of completed assignments was computed for each student for each week. Students were placed in self-instruction if they completed less than 75% of their assignments during both baseline weeks. If students had completed less than 75% of their assignments for one of the two weeks, the classroom teacher decided whether the student would receive the self-instruction training.

All students were involved in a series of three workshops. These workshops were held at the end of week two, three and four of the program. The purpose of the workshops was to teach the students specific skills they could use to modify their own behavior.

In the first workshop, the instructional procedure followed was to:

1. Introduce the word BEHAVIOR. Students were asked to:
   a. Define behavior, (Something that someone does that you can see and count).
   b. Give examples of some behaviors that you do at home? At school?
   c. Discuss appropriate and inappropriate behavior. (Yelling at a football game is acceptable. Is it also acceptable to yell in the library? Why? Why not?).
2. Show a movie that depicted a series of classroom behaviors. The

Project AIMS movie designed for observational training was used.

a. Students were asked to name the behavior shown.

b. Students were asked if the sequence shown described an appropriate (good) or inappropriate (bad) behavior. The language used varied according to the grade level of the students.

3. Introduce the "Daily Accomplishment Sheet".

a. Talk about the importance of completing assignments.

b. Explain to students how the chart is to be used. The "Daily Accomplishment Sheet" is a chart that allows students to list their subject areas and track their own assignment completion daily. Students were told that their charts would be taped on their desks. They were asked to bring these charts to the second workshop. Points were earned by students for good performance.

During the third program week, the self-instruction procedures were implemented with identified students. The following steps were taken before training:

1. Before the first day of self-instruction training, the parents were notified of their child's involvement in the program. They were told that an accomplishment sheet would be sent home each day that 100% of their child's assignments were completed. The parents were asked to provide liberal amounts of praise when their children brought home the "Accomplishment Sheet".

2. The project staff member who worked with each student explained the token system to each student. Students could earn ten points a day to spend in the AIMS room if all their assignments were completed.

3. If the 100% level of assignment completion was met for the entire week, the student's points would be doubled.

4. A list of the students who were receiving self-instruction training for the week was given to the principal who was asked to check on self-instruction students and encourage them to finish their assignments.

5. At the end of training, the classroom teacher was given goal slips. The teacher was asked to give one of these daily to each student who completed 100% of his/her assignments. This follow-up program was continued for two weeks. The goal was to insure durability.

Prior to the training, teachers were asked what subject area the student needed the most help in. Teachers were also asked to provide the materials in this subject area for the student to work on during self-instruction training. Students received self-instruction training for one half hour per day for at least four consecutive days. Procedures used during training involved a six step procedure outlined by Bornstein and Quevillon (1976) and Meichenbaum and Goodman (1971).

These steps were:

1. The experimenter modeled the task while talking aloud to himself.
2. The subjects performed the task while the experimenter instructed aloud.
3. The subjects performed the task talking aloud to themselves while the experimenter whispered softly.
4. The subjects performed the task whispering softly while the experimenter made lip movements but no sound.
5. The subjects performed the task making lip movement without sound while the experimenter self-instructed covertly.
6. The subject performed the task with covert self-instruction.

After the six steps were completed, students practiced the self-instruction procedure on other assignments. To complete the six steps, acceptable responses were those that included four elements:

a. Questions about the task. (e.g., "What does the teacher want me to do?")
b. Answers to questions in the form of cognitive rehearsal. (e.g., "Oh, that's right, I'm supposed to do 1 - 10.")
c. Self-instructions that guide through the task. (e.g., "O.K., first, I have to multiply 5 X 4.")
d. Self-reinforcement. (e.g., "Hey, I got it!")

Verbal praise was used to reinforce appropriate responses. The time spent in self-instruction training varied, depending on the level of assignment completion attained each week. No student received more than two weeks of self-instruction training.

During week three, the second workshop was held, the procedures followed were:

1. The student's Daily Accomplishment Sheet was checked to see if the students were tracking their own assignment completion and recording it in the prescribed manner.
2. Students who had been recording their assignment completion accurately were rewarded with 20 points that could be used to purchase items in the AIMS room.
3. A review of what behavior meant and examples of appropriate and inappropriate behaviors were discussed. Students were asked to verbalize good and bad behaviors which they saw in the classroom.
4. Each student was involved in a role play simulation. The roles were written ahead of time and the students simulated classroom situations. Probable consequences of each acation were discussed and included in the presentation.
5. After role playing, the students were asked to verbalize responses to a series of four mediation questions. This mediation training was adopted from Blackwood, (1970). The questions were:
   a. What had they done wrong?
   b. What unpleasant things happened to them when they (name the misbehavior)?
   c. What should they have been doing?
   d. What good things happened when they (name the appropriate behavior)?
6. Finally, all students were reminded to continue recording their assignment completion and to do their best to get all of their work completed.

The final workshop was held during week four. The objective for workshop number three was to reinforce students for accurately recording their Daily Accomplishment Sheets and for completing their assignments. Those students who had improved were rewarded with extra points in the AIMS room.

A review of the definition of behavior and a review of appropriate and inappropriate classroom behaviors was conducted. Teachers and students continued data collection through week five, the final week of the program.

Evaluation Procedure A time series statistical procedure called the Shewart Technique (Gottman and Leiblum, 1974) was used to evaluate the present study.

A number of reasons contributed to the selection of this procedure. Among those were:

1. This statistical procedure would reveal each individual students' progress so that the staff could make appropriate and timely changes in program.
2. Single subject designs (N = 1) are difficult to manage in an educational application because:
   a. Reversals are extremely unpopular with teachers and probably not appropriate to a self-instruction procedure which, if effective, is a non-reversible phenomenon.
   b. The multiple baseline design would require more extensive data collection. The difficulties involved in convincing classroom teachers of diverse educational philosophies and backgrounds to collect these data suggested that reliability would suffer with such an extension.
3. The Shewart Technique establishes a .05 level of assignment completion for each student prior to the intervention. This allows for the establishment of a formative goal or level of success which can serve several purposes.
   a. Evaluation of each students' intervention is easily determined. When the assignment completion percentage exceeds the .05 level, the program is a success.
   b. The classroom teacher can see the significant increase in each students' program. This success prompts the teacher to continue the program, thereby assuring its durability.
   c. The .05 level can be used as a goal in the development of individual student motivation plans.

RESULTS

Figures 1 and 1A contain the findings for the present study. These graphs display the percent of assignments completed each day for the twelve subjects on whom data was collected in all three phases. The chart consists of

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Insert Figures 1 and 1A About Here
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a continuous measurement format used to identify change in each students' level of assignment completion. Included in this evaluation format are three major phases. First is the baseline data which was collected for ten school days. Variation in the number of data plots for each student occurred due to absences and various school activities. The second phase of the program was intervention, the time during which self-instruction and contract implementation were taking place. Follow-up was the final phase. It included data taken during May as an end of year check (EOYC on graph). These data were collected to give some indication of the procedures' durability. The dotted line extending horizontally across all three phases is the .05 level of significance, as established by the Shewart Technique.

Subjects #1, #4, #5, #7, #8, and #9 demonstrated assignment completion percentages that exceeded the .05 level for the number of days necessary to establish significance using the Shewart Technique. Subjects #3, #11, and #12 failed to achieve the number of days above the .05 level necessary to call them successful. A visual inspection of these graphic data shows no noticeable change in the assignment completion percentage by Subject #11. Some decrease in variability and a slight increase in assignment completion percentage is apparent with Subjects #3 and #12. Subject #2 and #6 had such extreme variability during their baseline measurement that the .05 level was established beyond the 100% assignment completion level. Subject #2 performed at the 100% level throughout the self-instruction and contract phase, with the exception of the first day of intervention. While the .05 level established was beyond the reach of this student, the percentage change from baseline to intervention was the largest of any of the twelve subjects. Although subject #6 continued to show extreme variability throughout the intervention, the last five days of intervention and follow-up were all at the 100% level.

Figure #2 is a comparison of the mean percentage of assignment completion within the three separate phases presented in a bar graph format. While

- - - - - - - - - - - - - - - - - - - -
Insert Figures 2 and 2A About Here
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this graph is a repetition of the data presented in Figure 1, an idea of the general program effectiveness is given by eliminating the day to day variability.

Six of the twelve subjects showed uniform increases with each successive phase. Subject #1, #3, #4, #5, #6, and #9 each improved in their assignment completion percentage during intervention when compared to baseline. These subjects also showed increases during the EOYC when compared to the intervention. Three of the remaining six subjects showed an improvement from baseline mean percentage to intervention, but showed a slight decrease from intervention to the end of year check. Subjects #7, #8, and #12 each demonstrated this pattern.

Of the remaining three subjects, one (Subject #2) had an increase of 16 points from baseline to intervention but fell to the lowest level of any student during the end of year check. Subject #10 showed a decreased level of assignment completion during intervention, but the end of year check was at the highest level of any of the phases. Subject #11 demonstrated a decrease from baseline to intervention. This decrease remained stable throughout the end of year check.

DISCUSSION

The findings indicate that strategies developed within the Applied Behavior Analysis field of self-control may be used effectively to increase the assignment completion percentage of academically deficient students. When the self-instruction procedures are used in combination with a reinforcement program implemented by the classroom teacher, increases in individual students' productivity is possible.

The present study lends support to the self-instruction program as developed by Michenbaum and Camron and implemented by Bornstein and Quevillon. While their procedure was used to achieve better working skills with impulsive kindergarten students, the present study indicates that the effectiveness of these procedures may be more general when combined with a well structured reinforcement system. No attempt was made in the present study to compare the impact of self-instruction to the impact of the contractual reinforcement system. The self-instruction procedures were used to communicate appropriate working skills and to point out the new contingencies that would be available if the students used these skills.

In the present study 35 of the students were identified from among the

120 students who were enrolled in the Project AIMS Resource Room. These 35 students were identified using an assignment completion measure and a screening instrument. Classroom teacher agreement that the identified students did need extra help, confirmed the effectiveness of the identification procedure. This confirmation of the reliability of these data collection procedures lends weight to the argument for their use in mainstreming situations. By tracking students' classroom productivity, some of the difficult situations that occur when a child is placed in a regular classroom can be averted.

In the present study an analysis of the data collected for 12 of these 35 students identified in Project AIMS during the 1977-78 school year was presented. These 12 were randomly selected from the larger population because it was not possible to collect follow-up data on all 35 students. While the Shewart Technique was not appropriate for all students in the program, a .05 level of significant change was established for the majority of the students involved in the program. With 35 students scoring at or below the 75% level of assignment completion during the 1977-78 year of Project AIMS, 27 of the 35 students had an achievable .05 level established using the Shewart Technique. Of these 27, 19 met or exceeded the criterion.

A minority of the students in the present study failed to meet the improvement criterion established. At least one of the students involved in the program showed a decrease in productivity from baseline to intervention and end of year check. Additional study is necessary to determine why this program affected students differentially. A part of the problem concerns the large number of teachers and diverse settings in which the present application was attempted. Variability from teacher to teacher occured in philosophy of education, reinforcers available in the classroom, structure of the classroom, difficulty level of the material worked with, and a large number of other possibly relevant factors which were not directly studied. The success of the present study should be considered in the light of these factors. Most studies are initiated and carried out in settings that minimize these variables. It is not possible to minimize these difficulties when working from the job role of resource room teacher, school psychologist or building principal. The present study was an attempt to demonstrate the effectiveness of a program that could be implemented successfully in these conditions.

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Figure Captions

Figure 1 and 1A: The daily assignment completion percent for each of the 12 students.

Figure 2 and 2A: The mean percent of assignments completed by each student in each measured condition.

FIGURE 1

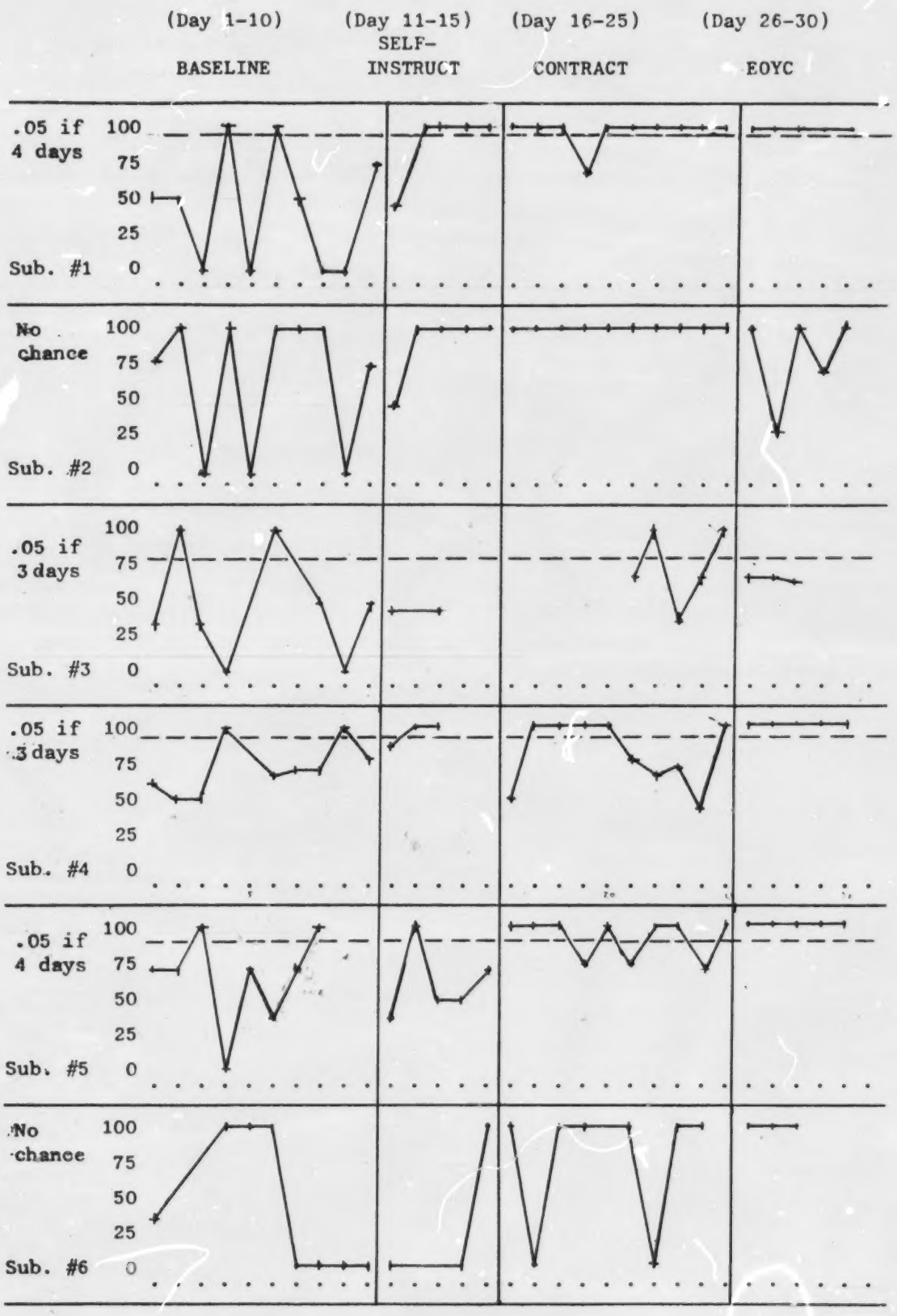
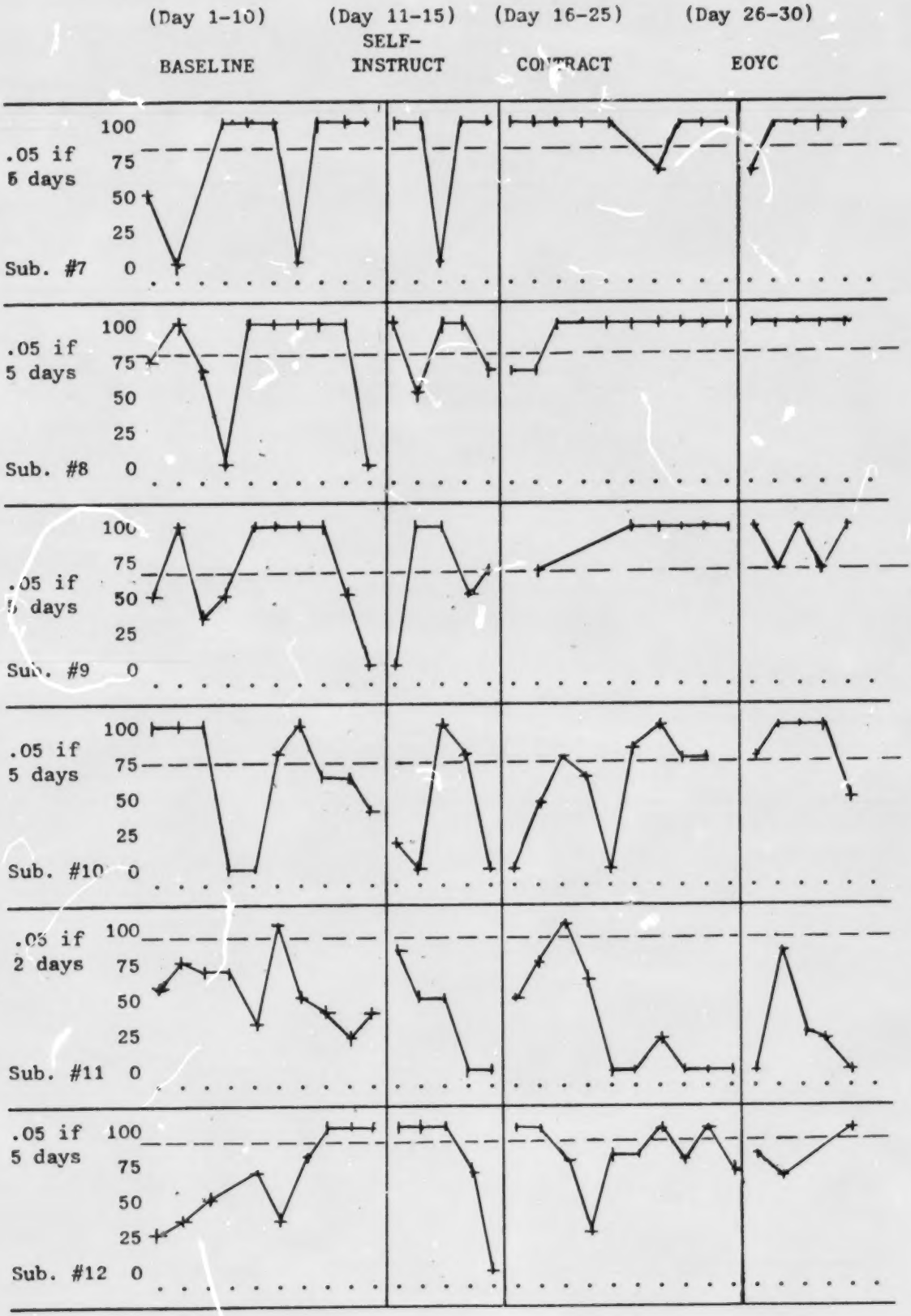
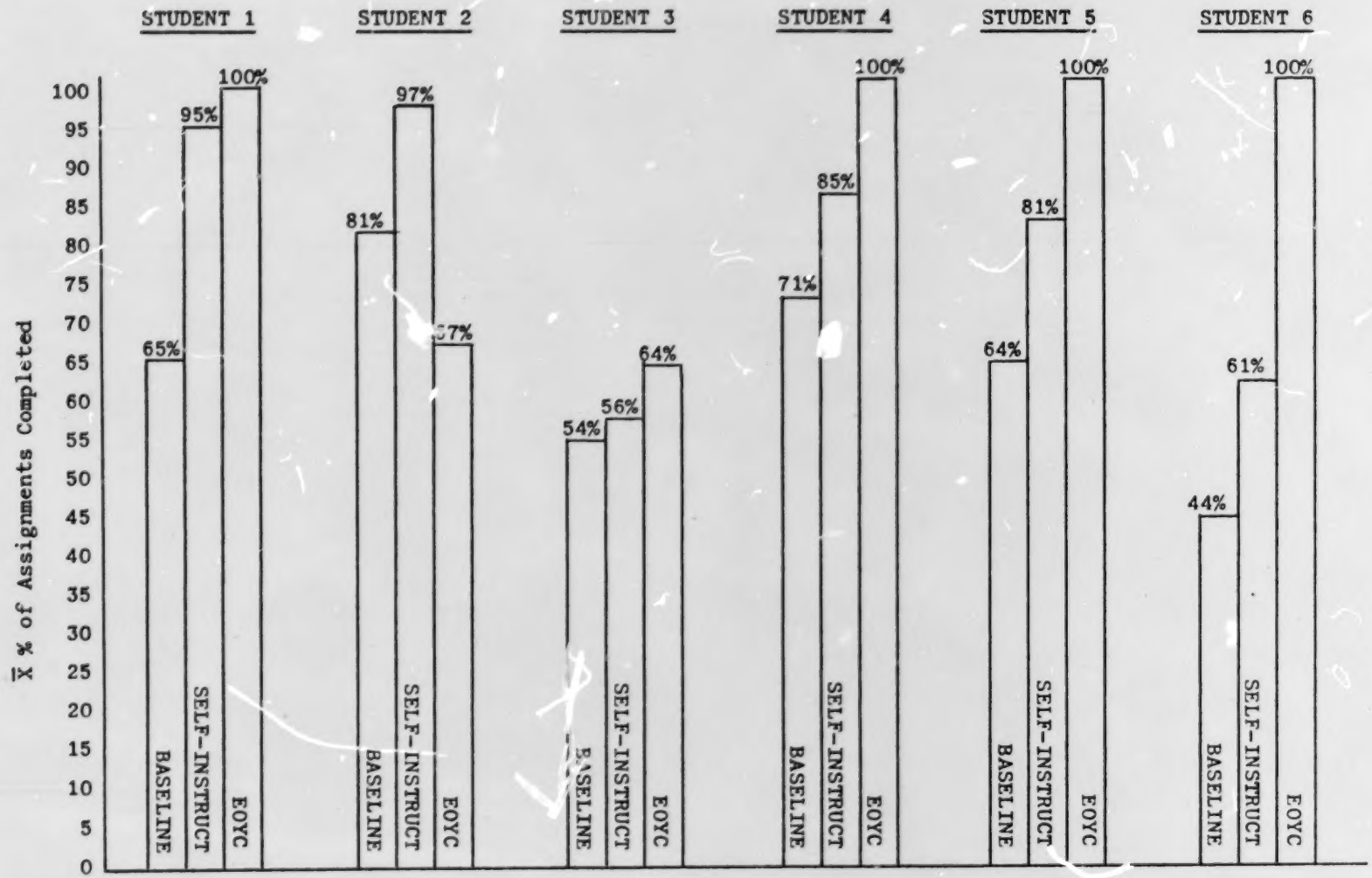

(Day 1-10)
BASELINE
(Day 11-15)
SELF-INSTRUCT
(Day 16-25)
CONTRACT
(Day 26-30)
EOYC
.05 if 4 days
Sub. #1
No chance
Sub. #2
.05 if 3 days
Sub. #3
.05 if 3 days
Sub. #4
.05 if 4 days
Sub. #5
No chance
Sub. #6
100
75
50
25
0

FIGURE 1A


(Day 1-10)
BASELINE
(Day 11-15)
SELF-INSTRUCT
(Day 16-25)
CONTRACT
(Day 26-30)
EOYC
.05 if 5 days
100
75
50
25
0
Sub. #7
Sub. #8
Sub. #9
Sub. #10
.05 if 2 days
Sub. #11
Sub. #12

SELF-INSTRUCT STUDENTS

ASSIGNMENT COMPLETION DATA



SELF-INSTRUCT STUDENTS

ASSIGNMENT COMPLETION DATA